AVIATION MAINTENANCE II

COURSE DESCRIPTION

Aviation Maintenance II continues the general aviation maintenance content begun in *Aviation Maintenance I.* The course prepares students for gainful employment or further study leading to Federal Aviation Administration (FAA) certification in Airframe and/or Powerplant certification. Course content includes sheet metal, aircraft wood and fabric, avionics, assembly and rigging of rotary wing aircraft, aircraft inspections and a review of all Federal Aviation Administration (FAA) Regulations that govern technicians.

Pre-requisites: Aviation Maintenance I, Algebra I or Math for Technology II; Physical Science or Principles of Technology I

Recommended Credits: 2

Recommended Grade Levels: 11th, 12th

Note 1: Instructors of Aviation Maintenance must be certified as an Airframe and Powerplant Technician by the Federal Aviation Administration.

Note 2: A minimum of 200 hours must be dedicated to Aviation Maintenance II to meet minimum standards set by the Federal Aviation Administration (FAA).

- FAA regulations require a minimum of 400 contact hours in General Maintenance toward Airframe or Powerplant certification (to be met by *Aviation Maintenance I and II*.)

Note 3: The following defines terms used in the Performance Standards and describes the level of proficiency at which items under each subject in each curriculum must be taught, as outlined.

(A) Definitions.
(1) "inspect" means to examine by sight and touch.
(2) "check" means to verify proper operations.
(3) "troubleshoot" means to analyze and identify malfunctions.
(4) "service" means to perform functions that assure continued operation.
(5) "repair" means to correct a defective condition. Repair of an airframe or powerplant system includes component replacement and adjustment, but not component repair.
(6) "overhaul" means to disassemble, inspect, repair as necessary, and check.

(B) Teaching levels.

(1) Level 1 requires:

(i) knowledge of general principles, but no practical application

(ii) no development of manipulative skill

(iii) instruction by lecture, demonstration, and discussion

(2) Level 2 requires:

(i) knowledge of general principles, and limited practical application

(ii) development of sufficient manipulative skill to perform basic operations

(iii) instruction by lecture, demonstration, discussion, and limited practical application

(3) Level 3 requires:

(i) knowledge of general principles, and performance of a high degree of practical application

(ii) development of sufficient manipulative skill to simulate return to service

(iii) instruction by lecture, demonstration, discussion, and a high degree of practical application

(C) Teaching materials and equipment. The curriculum may be presented utilizing currently accepted educational materials and equipment, including, but not limited to: calculators, computers, and audio-visual equipment.

AVIATION MAINTENANCE II STANDARDS

1.0 Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

2.0 Student will demonstrate aircraft weight and balance skills.

3.0 Students will maintain aircraft fluid lines and fittings.

4.0 Students will demonstrate aircraft materials and processes skills.

5.0 Students will perform ground operations and cleaning and corrosion control procedures.

6.0 Students will apply Federal Aviation Regulations that govern certified Aircraft Technicians and use required maintenance forms, records, and relevant publications.

7.0 Students will demonstrate communication skills required in the aviation maintenance industry.

8.0 Students will demonstrate interpersonal and employability skills required in the aviation maintenance industry.

9.0 Students will demonstrate aviation technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for an aviation maintenance facility.

AVIATION MAINTENANCE II

STANDARD 1.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

LEARNING EXPECTATIONS

The student will:
1.1 Lead a team.
1.2 Participate in SkillsUSA-VICA as an integral part of classroom instruction.
1.3 Assess client complaint and apply problem-solving and decision-making skills to communicate with the client.
1.4 Demonstrate teamwork skills.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
1.1.A As a team leader, demonstrates character and leadership skills to accomplish a project.
1.1.B Evaluates the effectiveness of a team and develops a plan for improvement.
1.2.A Applies the points of the creed and purposes of SkillsUSA-VICA in the classroom and laboratory.
1.2.B Demonstrates rules of parliamentary procedure to express ideas to a group.
1.3.A Analyzes situations in the workplace and uses conflict resolution techniques to solve the problem.
1.3.B Follows work order and communicates with client.
1.4 Participates in a group to diagnose electrical systems.

SAMPLE PERFORMANCE TASKS

- Analyze the classroom and laboratory structure. Compile a proposal to organize the classroom and laboratory to show improvement in effectiveness.
- Participate in various SkillsUSA-VICA programs and/or competitive events.
- Evaluate an activity within the school, community, and/or workplace and develop a plan for improvement using teamwork skills.
- Implement an annual program of work.
- Prepare a meeting agenda for a SkillsUSA-VICA monthly meeting.
- Attend a professional organization meeting or trade show relating to the automotive service industry.

INTEGRATION LINKAGES

SkillsUSA-VICA, *Professional Development Program,* SkillsUSA-VICA, Communications and Writing Skills, Teambuilding Skills, Research, Language Arts, Sociology, Psychology, Math, Math for Technology, Applied Communications, Social Studies, Problem Solving, Interpersonal Skills, Employability Skills, Critical-Thinking Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division.

AVIATION MAINTENANCE II

STANDARD 2.0

Student will demonstrate aircraft weight and balance skills.

LEARNING EXPECTATIONS

The student will:
2.1 Analyze the importance of aircraft weight and balance.
2.2 Weigh aircraft using proper personal safety procedures.
2.3 Calculate and record weight and balance information.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET:

The student:
2.1.A Examines the role of weight in aircraft performance and safety.
2.1.B Examines the role of balance in aircraft performance and safety.
2.2.A Weighs an aircraft. (to proficiency level 2)
2.2.B Performs complete weight and balance check on an aircraft. (to proficiency level 3)
2.3.A Performs weight and balance calculations for an aircraft. (to proficiency level 3)
2.3.B Records weight and balance data for an aircraft. (to proficiency level 3)

SAMPLE PERFORMANCE TASKS

- Prepare aircraft for weighing, observing safety precautions.
- Compute moment, arms and empty weight center of gravity as well as forward and aft center of gravity limits for a specific aircraft.
- Complete weight and balance check and record data for a specific aircraft.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division.

AVIATION MAINTENANCE II

STANDARD 3.0

Students will maintain aircraft fluid lines and fittings.

LEARNING EXPECTATIONS

The student will:
3.2 Use appropriate tools for fluid line maintenance.
3.3 Manufacture and install rigid and flexible fluid lines and fittings.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET:

The student:
3.1.A Determines the appropriate tool for the task.
3.1.B Correctly and safely uses special fluid-line tools.
3.2.A Fabricates rigid and flexible fluid lines. (to proficiency level 3)
3.2.B Installs rigid and flexible fluid lines. (to proficiency level 3)

SAMPLE PERFORMANCE TASKS

- Fabricate and install a rigid line.
- Fabricate and install a flexible line.
- Demonstrate hand bending, single and double flaring, beading and filing.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

AVIATION MAINTENANCE II

STANDARD 4.0

Students will demonstrate aircraft materials and processes skills.

LEARNING EXPECTATIONS

The student will:
4.1 Examine various aircraft covering materials, finishes, and wood structures.
4.2 Perform approved methods and procedures for care of materials, finishes, and wood structures.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET:

The student:
4.1.A Analyzes the properties and functions of materials used in aircraft.
4.1.B Distinguishes and selects aircraft hardware and materials. (to proficiency level 3)
4.2.A Selects appropriate nondestructive testing methods. (to proficiency level 1)
4.2.B Performs dye penetrant, eddy current, ultrasonic, and magnetic particle inspections. (to proficiency level 2)
4.2.C Performs basic heat-treating processes. (to proficiency level 1)
4.2.D Inspects and checks welds. (to proficiency level 3)
4.1.E Performs precision measurements. (to proficiency level 3)
4.1.F Performs safety wiring techniques.

SAMPLE PERFORMANCE TASKS

- Determine and perform the appropriate care for a specific aircraft material.
- Perform a magnetic particle inspection on an aircraft.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

AVIATION MAINTENANCE II

STANDARD 5.0

Students will perform ground operations and cleaning and corrosion control procedures.

LEARNING EXPECTATIONS

The student will:
5.1 Perform ground operation and servicing.
5.2 Demonstrate proper procedures for aircraft cleaning and corrosion control.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET:

The student:
5.2.A Starts, ground operates, moves, services, and secures aircraft. (to proficiency level 2)
5.2.B Identifies typical ground operation hazards. (to proficiency level 2)
5.2.C Distinguishes and selects fuels. (to proficiency level 2)
5.3.A Distinguishes and selects cleaning materials. (to proficiency level 3)
5.3.B Inspects, identifies, removes, and treats aircraft corrosion. (to proficiency level 3)
5.3.C Performs aircraft cleaning. (to proficiency level 3)

SAMPLE PERFORMANCE TASKS

- Select the appropriate cleaning materials for a given task.
- Recognize and treat corrosion on an aircraft.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

AVIATION MAINTENANCE II

STANDARD 6.0

Students will apply Federal Aviation Regulations that govern certified Aircraft Technicians and use required maintenance forms, records, and relevant publications.

LEARNING EXPECTATIONS

The student will:

6.1 Interpret Federal Aviation Administration (FAA) regulations affecting aircraft maintenance technicians.

6.2 Access and use aircraft manufacturers' publications and complete forms and records.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

6.1.A Accesses relevant Federal Aviation Administration (FAA) regulations.

6.1.B Interprets the exercise of mechanic privileges within prescribed limitations. (to proficiency level 3)

6.2.A Writes descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records. (to proficiency level 3)

6.2.B Completes required maintenance forms, records, and inspection reports. (to proficiency level 3)

6.3.A Reads, comprehends, and applies information contained in Federal Aviation Administration (FAA) and manufacturers' aircraft maintenance specifications, data sheets, manual, publications, and related Federal Aviation regulations, Airworthiness Directives, and Advisory material. (to proficiency level 3)

6.3.B Reads technical data. (to proficiency level 3)

SAMPLE PERFORMANCE TASKS

- Detail the issuance, duration, experience, and limitations of maintenance technician certificates.
- Select and use technical standard orders.
- Select the appropriate manual to locate information needed for a given task.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

AVIATION MAINTENANCE II

STANDARD 7.0

Students will demonstrate communication skills required in the aviation maintenance industry.

LEARNING EXPECTATIONS

The student will:

7.1 Interpret Federal Aviation Regulations that typically apply to the aviation maintenance workplace.
7.2 Solve problems and make decisions using a logical process.
7.3 Use teamwork skills to accomplish goals, solve problems, and manage conflict within groups.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

7.1.A Uses electronic resources to obtain, collect, and process information regarding the Federal Aviation Regulations.
7.1.B Analyzes information obtained to determine compliance to Federal Aviation Regulations.
7.1.C Communicates clearly and appropriately in oral and written form.
7.2.A Develops a hypothesis regarding the cause of a problem.
7.2.B Tests the hypothesis to determine the solution to the problem.
7.2.C Creates, evaluates, and revises as needed a plan to resolve a problem.
7.3.A Serves in each of the functional roles of a team.
7.3.B Resolves conflicts within a group.
7.3.C Demonstrates appropriate and positive examples of giving and accepting criticism.
7.3.D Modifies behavior or revises work based on appropriate criticism.
7.3.E Solves problems in cooperation with other members of a group.
7.3.F Evaluates the role of the aviation maintenance technician within the organizational system of an aviation employer.

SAMPLE PERFORMANCE TASKS

- Present oral or written report on information gleaned from Internet research.
- Use reference materials to determine procedures for an assigned task.
- Work as a team member to develop a strategy for completing an assigned task.
- Use blueprints and diagrams to execute a task.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

AVIATION MAINTENANCE II

STANDARD 8.0

Students will demonstrate interpersonal and employability skills required in the aviation maintenance industry.

LEARNING EXPECTATIONS

The student will:

8.1 Infer relationships between honesty, integrity, and organization and personal job success.
8.2 Demonstrate attitudes conducive to workplace success.
8.3 Maintain aviation maintenance equipment in a neat and orderly work area.
8.4 Assess implications of cultural and religious diversity for classroom and workplace relationships.
8.5 Develop individual and team time management and work sequencing skills to increase productivity.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

8.1.A Illustrates the concept of integrity.
8.1.B Assesses the potential impact of an individual's work ethic on an organizational system.
8.1.C Infers the relationship between organization and personal job success in aviation maintenance systems.
8.2.A Modifies behavior to increase productivity in the classroom, laboratory and workplace.
8.2.B Demonstrates awareness of activities occurring concurrently in the classroom and workplace.
8.3.A Keeps aviation maintenance equipment in a clean and organized work area.
8.3.B Maintains work area according to FAA standards.
8.3.C Recognizes the correlation between a clean orderly work environment and successful and efficient job in electrical and electronics systems servicing.
8.4.A Assesses benefits and predicts problems that may arise from diversity in work teams.
8.4.B Devises solutions to problems arising from gender, cultural, racial, and religious diversity.
8.5.A Assesses the benefits of incorporating time management principles into aviation maintenance.
8.5.B Displays time management and work sequencing skills in aviation maintenance.
8.5.C Demonstrates the ability to diagnose and repair aviation systems within manufacturers labor operation time.

SAMPLE PERFORMANCE TASKS

- Maintain an orderly work area.
- Lead a problem-solving team.
- Consistently arrive at class on time.
- Participate in an internship in a dealership.
- Resolve an interpersonal conflict in the classroom.
- Using case scenarios follow strategy based diagnostic procedure to verify the complaint, define the problem, isolate the problem, validate the problem, make the repair, and test the repair. Complete a repair order using technical writing skills and calculate salary earnings based on the repair order description and manufacture allowances for each item on the work order. Calculate manufacturer labor operation time used in the diagnostic process.

INTEGRATION LINKAGES

Language Arts, Applied Communications, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division.

AVIATION MAINTENANCE II

STANDARD 9.0

Students will demonstrate aviation technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for an aviation maintenance facility.

LEARNING EXPECTATIONS

The student will:

9.1 Determine safe and correct procedures for working with aviation maintenance.
9.2 Use protective clothing, eye protection, and safety equipment.
9.3 Use fire protection equipment.
9.4 Follow OSHA, EPA, FAA regulations and manufacturers specifications aviation maintenance.
9.5 Respond to safety communications referring to aviation maintenance.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

9.1.A Conforms to federal, state, local regulations, and manufacturer's specifications when working with aviation maintenance.
9.1.C Inspects first aid supplies and determines supplies and procedures for injuries common to aviation maintenance.
9.2.A Demonstrates proper usage of special safety equipment used while working on electrical and electronic systems.
9.2.B Selects and uses the appropriate protective clothing and eye and ear protection.
9.3.A Selects the proper fire extinguisher for an electrical fire.
9.3.B Demonstrates the proper use of a fire extinguisher and determines effectiveness.
9.4.A Locates FAA regulatory information and manufacturer recall information pertaining to aviation maintenance systems.
9.4.B Extracts information from Material Safety Data Sheets.
9.4.C Complies with relevant regulations and standards pertaining to aviation systems.
9.4.D Passes with 100% accuracy a written examination relating specifically to *Aviation Maintenance II* safety issues.
2.4.E Passes with 100% accuracy a performance examination relating specifically to *Aviation Maintenance II* tools and equipment.
9.4.F Maintains a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.
9.5.A Interprets FAA and manufacturer correspondence for safety regulations.
9.5.B Complies with safety procedures.

SAMPLE PERFORMANCE TASKS

- Assess the work area for safety hazards.
- Design a corrections program for identified hazards.
- Model the appropriate protective equipment for an assigned task.
- Read manufacturer specifications to determine safe practices while working on various electrical and electronic systems.

INTEGRATION LINKAGES

Language Arts, Science, Math, Math for Technology, Electronics, Computer Skills, Research and Writing Skills, Communications Skills, Teamwork Skills, Leadership Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Federal Aviation Administration (FAA), PAMA (Professional Aviation Maintenance Association), ATEC (Aviation Technical Education Council), Tennessee Aeronautics Division, Occupational Safety and Health Administration (OSHA), Tennessee Occupational Safety and Health Administration)YOSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

SAMPLING OF AVAILABLE RESOURCES

14 CFR - Chapter I - Part 147, Code of Federal Regulations

Aviation Maintenance Technician Series – General, Aviation Supplies & Academics, April 2000

Aviation Mechanic Handbook, Aviation Supplies & Academics, September 2001

Aviation Educational Multimedia Library, Aviation Technician Education Council (ATEC), www.atec-amt.org